IAPR

International Association for Pattern Recognition Inc

An affiliate member of the International Federation for Information Processing

NEWSLETTER

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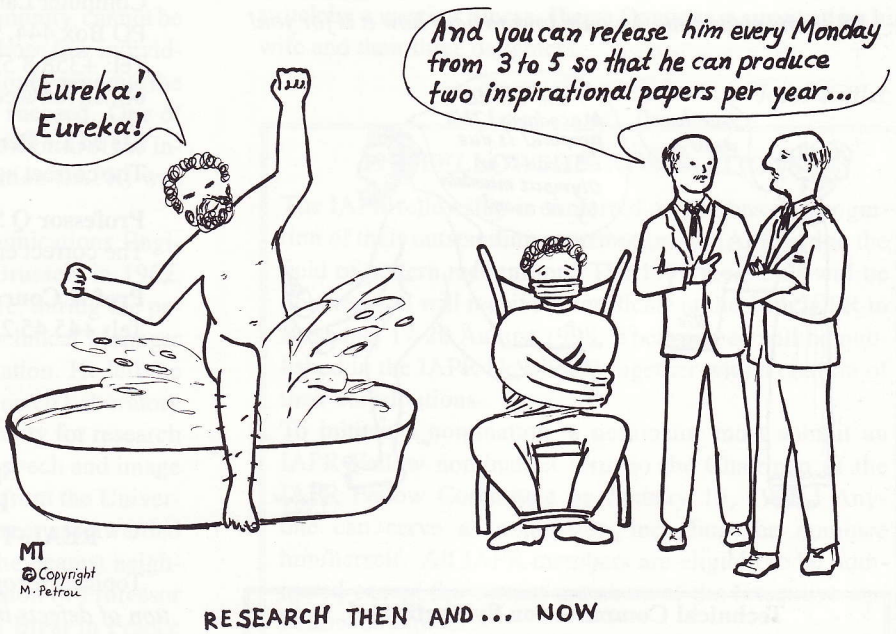

RESEARCH THEN AND... NOW

From the Editor's Desk

Dear Anybody,

How is it for you? You are in Japan, China, India, Russia, Belarus, UK, USA,...You are in 33 different countries. How is it for you? Do they ask you to do research, administration, teaching, to write proposals and form consortia, to write journal papers and get industrial support and do they tell you that there is no money for keeping up your salary with inflation? Do they put you through "research assessment exercises" and "teaching quality assessments" and give you marks for being a "good boy", or a "bad girl"? Do they count papers, citations and grands? Have you ever had a proposal rejected because it did not have industrial support, only to have it resubmitted and re-rejected because it was "so relevant to industry that industry should fund it"? Have you ever felt that you were asked to walk on a tight rope over a river with crocodiles below, ready to pick a little omission or fault so that your proposal is rejected? Have you ever felt that you were playing crazy golf with the hole at the top of a hill, so that if you push too little, the ball does not reach it and if you push too hard, the ball goes to the other side? I bet you have, if you live in a country that believes in market forces! Market forces per-

haps have shaped the world, but market forces in research is a totally modern idea. We have terms now in the academic vocabulary like "lobbying" and "professional proposal writing" (apparently it costs about UK £7000 to have your proposal written by an expert).

However, throughout the millenia, humans have found ways of beating even the most stifling and oppressive systems: Researchers fight back now! The common secrete is that people no longer submit proposals on what they want to work on; they rather do the work first, one way or another, and then, knowing where it leads, they submit proposals for funding work they have already done! Can you imagine Archimedes lobbying Jupiter to fund his research? And can you imagine him adapting to our circumstances and *after* having discovered the buoyancy force, jumping out of his bath and running naked to Olympus mountain to submit a proposal for research on "throwing precious metals in water" with application to "ships that can sink at will" and exploitation plans for 2,000 years, hence?

Adjustability is the art of survival, but it is also the force of peaceful destruction: flowers that adjust, flourish even on concrete, breathing through the pores of the cement at the beginning, through the cracks they create later! Let us hope that one day the cracks we open now, will become gaping holes, so that even the most blinking politicians, advocates of the market forces in research, will be able to see through them.

Maria Petrou

PS *In the mean time, I would love to hear how it is for you!*

Technical Committee on Syntactic and Structural Pattern Recognition (TC-2): A success story

TC-2, one of the most successful IAPR technical Committees, with the well established series of workshops it organises on Syntactic and Structural Pattern Recognition, (SSPR), recently established its own web-site in URL: http://iew3.technion.ac.il:8080/ sspr94/
The page contains a pointer to SSPR'98 to be held in Sydney, Australia in conjunction with ICPR in Brisbane, in August 1998. There is also a pointer to a comprehensive account on past SSPR workshops which was written with a lot of care and attention by Professor A Sanfeliu.

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Special Issue of the journal of REAL-TIME IMAGING on REAL-TIME DETECTION OF DEFECTS

Topics: *recognition and classification of defects, detection of defects in texture and pattern, detection of shape defects, detection of defects in colour, defect modelling: fractals, statistic, etc, automatic acquisition of models suitable for defect detection, validation techniques for defect detectors.* Papers must be submitted by October 31, 1997 to the address below. Submission guidelines in ftp:osiris.cee.hw.ac.uk (anonymous login, then cd pub/rtispecial) http://www.cee.hw.ac.uk/ mtc/special/call.html.

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Obituary

Professor Pierre DEVIJVER

Dr Pierre Devijver, President of IAPR 1986-1988, died in Brest, France, on 28 December 1996 aged 58. He was borne in Ougrée, Belgium on November 4, 1938.

The establishment and growth of a new learned society, especially when it involves creating and moulding an organisation to support the needs of an evolving community, cannot be accomplished without the driving force of those few individuals whose vision and selfless dedication helps to generate the necessary momentum for the endeavour to succeed. One of such pioneers who was actively involved in the birth of the International Association for Pattern Recognition (IAPR) was Pierre Devijver.

Pierre Devijver graduated in Telecommunications Engineering from the Royal Military School, Brussels in 1962. His career started in the Belgian army where, during the period 1967-69, he was responsible as the Technical Manager of the 1st NATO satellite communication station. He left the Belgian army in 1969 to join the Philips Research Laboratory in Brussels where he assumed the responsibility for research in pattern recognition with applications to speech and image interpretation. He received his PhD degree from the University of Paris VI in 1977. The research degree was awarded for his work on pattern recognition using the nearest neighbour method, carried out under the supervision of Professor Jean Claude Simon. In 1989 he moved to Brest in France where he became the Scientific Director at the Ecole Nationale Superieure des Telecommunications (ENST). In 1993 he was appointed to Visiting Professorship at the Department of Electronic and Electrical Engineering, University of Surrey. During his scientific career in the field of pattern recognition, which span more than two decades, Professor Devijver gained international recognition for his contributions to statistical approaches of pattern classification. His work on nearest neighbour classifiers, causal Markov random models in speech and image processing, computational geometry, and connected component analysis deserves a particular mention. His seminal work on editing methods for the nearest neighbour classifier resulted in both the restoration of the Bayesian optimality for the nearest neighbour decision rule and its significant computational speed up. His profound understanding of the information content conveyed by nearest neighbours had an impact on error estimation, feature selection and error reject trade-off which his work amply manifests.

Dr Devijver was one of the founding members of IAPR. He served in the capacity of IAPR Secretary during 1980-84, and as 1st Vice-President in 1984-86. His active service in IAPR culminated with his election to the office of IAPR President in which he served during the period 1986-88. As Past President he chaired the IAPR Nominating Committee in 1988-90 and was actively involved in IAPR Committee work until the summer of 1996. He discharged all his responsibilities most professionally and meticulously. For his scientific contributions to pattern recognition and for his outstanding leadership in IAPR Dr Devijver was awarded IAPR Fellowship in 1994. In spite (or perhaps because) of his heavy scientific and professional schedule Pierre Devijver was actively involved in extramural activities. He ran a sports club for his colleagues at Philips in Brussels and ENST in Brest to promote physical fitness and kindle team spirit. He himself was a serious Marathon runner, joining regularly Marathons in Brussels and London. He participated in the London Marathon in April 1996, only a few weeks before being unexpectedly struck by a wasting illness. Pierre Devijver is survived by his wife and their three daughters.

Josef Kittler

1998 FELLOWSHIP NOMINATIONS

The IAPR fellowship is conferred on persons in recognition of their outstanding contributions to IAPR and to the field of pattern recognition. The 1998 recipients will be honored and will receive a certificate at the 14th ICPR in Brisbane, 17-20 August 1998. Their names will be published in the IAPR Newsletter together with a citation of their contributions.

To initiate a nomination, a nominator must submit an IAPR Fellow nomination form to the Chairman of the IAPR Fellow Committee by January 15, 1998. Anyone can serve as nominator, including the nominee him/herself. All IAPR members are eligible to be nominated except the current members of the Executive and Fellow committees.

Nomination form and detailed information about the 1998 Fellow selection process can be found in http://koigakubo.hitachi.co.jp/iapr.html. For those who cannot access WWW, these are also available in a printed form from the Chairman of the IAPR Fellow Committee:

Dr Masakazu Ejiri, Chairman, IAPR Fellow Committee,
Central Research Laboratory,
Hitachi, Ltd, Kokubunji, Tokyo 185, Japan.
Tel: +81 423 23 1111 Fax: +81 423 27 7700

News for Members

Good News for Eastern Europe

Central and Eastern European institutions in the future will be able to participate in European programmes (particularly in ESPRIT) *and* get funding. The emphasis of the COPERNICUS programme (which was set to encourage collaboration between the ex-Soviet block and Western Europe), will be slightly changed, moving from the development of new products to information dissemination and information societies.

Help with NATO grands

A Research Partner Bulletin Board has been established at the NATO Science web site to assist research scientists in finding collaborators. Scientists can either post details of their ongoing or planned research projects on the bulletin board, together with contact information, or they may search for potential partners among those already posted. To access this new service, click "Bulletin Board" from the NATO Science home page at: http://www.nato.int/science

Call for nomination
KING-SUN FU PRIZE

This biennial prize is given in honour of the memory of Professor King-Sun Fu, who was instrumental in the founding of IAPR, served as its first president, and is widely recognised for his extensive contributions to the field of pattern recognition. It is awarded to a living person in recognition of outstanding technical contribution to the field of pattern recognition, and consists of a cash amount and a suitably inscribed certificate. The prize is derived from interest income from a special fund set up for this purpose.

The prize recipient for 1998 will be selected by the Prize Committee, subject to approval by the IAPR Governing Board, upon nomination by a member of a national member society of IAPR and by endorsement of at least five members, representing at least two member societies different from that of the nominator's. Members of the IAPR Executive Committee, as well as of the Award Committee, are not eligible for the award and may not serve as nominators or endorsers. The 1998 award will be presented at the International Conference on Pattern Recognition in Brisbane, Australia, 17-20 August, 1998.

The nomination must be made on a special nomination form, and must be received by the Award Committee Chairman no later than 10 Dec 1997. To obtain copies of the nomination form, contact the chairman of the Prize Committee:

Dr Herbert Freeman, CAIP Center, Rutgers University,
CoRE Building 501, Frelinghuysen Rd,
P. O. Box 1390 Piscataway, NJ 08855-1390, USA
freeman@tesla.rutgers.edu, Fax: +1 908 4450593

COPYRIGHT AND THE INTERNET

WIPO and INTERDEPOSIT come to an agreement

WIPO, the World Intellectual Property Organisation (http://www.wipo.int), is a specialised agency of the United Nations with headquarters in Geneva. Its creation dates back to the adoption in 1883 of the Paris Convention for the Protection of Industrial Property and in 1886 of the Berne Convention for the Protection of Literary and Artistic Works. Its Arbitration and Mediation Canter is an administrative unit of the International Bureau of WIPO which administers procedures and manages the various services associated with intellectual property mediation and arbitration.

INTERDEPOSIT (http://www.iddn.ch), on the other hand, is a federation established in Geneva in 1994, to bring together the organisations involved in the deposit of digital works. INTERDEPOSIT has devised an international identification system that affords access to information concerning the ownership of rights and conditions of exploitation. The system is compatible with other standards currently being studied, and permits management in either direct form or through third parties (publishers, literary agents or collecting societies). INTERDEPOSIT is involved at a world level in the fight against the infringement of digital works.

WIPO and INTERDEPOSIT have entered into a collaboration arrangement for the settlement of disputes between creators and users of digital works. A treaty was signed in Geneva on December 20, 1996, which provides, among other things, for the imposition of sanctions on those who remove or alter devices that identify and manage authors' rights.

INTERDEPOSIT has proposed a system for the direct management of authors' rights. The system draws on all the resources of the computer technology and the Internet to introduce a virtual deposit of creations using a "logibox" coupled with a license that lays down the conditions of use. The user enters into a contract on the information super-highway, thereby implicitly accepting the INTERDEPOSIT Charter, which provides for the settlement by international arbitration (administered by WIPO) of any disputes arising out of the contract.

APP Paris (European Association of Authors and Information Technology Professionals), will carry out the task of Internet surveillance of unlawful uses. Thanks to automated search systems and the involvement of authorised agents, contacts will provide proof of copyright infringements and allow traditional legal proceedings to be brought if the infringers refuse WIPO arbitration.

□□□

The discount of 30% offered by Chapman & Hall for all its IFIP publications to the members of IFIP (and therefore to IAPR members), incresed to 35%. For more information, contact Chapman & Hall (Fax: +44 171 522 9623, katy.reeves@chall.co.uk) and see at http://www.ifip.or.at/public.htm, http://www.it-ch.com/

BOOK REVIEWS

Hypermedia Image Processing Reference by *R Fisher, S Perkins, A Walker and E Wolfart,* ISBN 0471 96243 0, John Wiley & Sons

The Hypermedia Image Processing Reference (HIPR) is an interactive teaching resource for image processing. It comes on a CD-ROM with adequate notes to guide the user for an easy installation. It requires about 75MB of storage.

The core of the system is made up of a large number of simple, customisable worksheets. Each worksheet is fully illustrated with a variety of images, all of which are accessible for separate use.

The hypertext presentation of this tutorial means that you can install the system and embark on a personally-paced, self-programmed, tuition exercise using your own favourite browser. Furthermore, you can edit and tailor it to your own purposes. The text is at an introductory level, but nevertheless covers a wide range of topics. An expert in the field could easily edit the appropriate pages to enhance and further detail a particular topic.

The worksheet topics are: Image Arithmetic, Point Operations, Geometric Operations, Image Analysis, Morphology, Digital Filters, Feature Detectors, Image Transforms and Image Synthesis.

The topics cover issues such as simple image addition and the Fourier Transform, all complemented with before and after images. In fact the package contains over 250 raw images and over 500 processed images.

I found this to be an excellent teaching package, as well as a handy on-line reference for myself. I asked three undergraduates who were about to do vision-based final year projects to learn about image processing through HIPR. They all had extremely positive comments to make. I recommend this package to anybody teaching a computer vision course at undergraduate level. Many of the worksheets will also be found useful by post-graduates.

Majid Mirmehdi,
University of Surrey

Probability and Measure, by *P Billingsley,* John Wiley & Sons, ISBN 0-471-00710-2, Third Edition

"Probability and measure" is a classical text which provides a sound mathematical background in probability theory that can be further complemented by statistical texts and by special books on statistical pattern recognition (for example, "A Probabilistic Theory of Pattern Recognition" by L Devroye, L Györfi and G Lugosi, Springer, 1996). Billingsley's book follows the axiomatic way to build up probability theory and requires a considerable mathematical commitment from its readers. The book covers such topics as basic probability, measure theory and Lebesgue integration, limit theorems and ergodicity, conditional probability, martingales and elements of stochastic processes. Although statistical methods are widely used in pattern recognition theory, their essence can be often grasped without solid knowledge in probability theory and mathematical statistics. The book has no immediate applications to pattern recognition or image analysis and would probably disappoint those readers who seek direct recipes. It is a preparatory undergraduate text in probability theory which is sound mathematically and perfectly presented. There is definitely a surplus of material inside that may be of no direct importance if only basic facts are of interest. Fortunately, the book is written in such a way, that it can easily be used as a reference text.

I would recommend Billingsley's book for committed readers who would like to develop their expertise in mathematical probability theory. This may be very useful in view of new data types that appear in pattern recognition and require application and knowledge of powerful methods from probability theory.

I Molchanov,
Department of Statistics, University of Glasgow

Linear Statistical Models by *James H Stapleton*, John Wiley and Sons, pp 449, ISBN 0 471 57150 4

This book gives a modern approach to a number of concepts of statistical models which are linear in the unknown parameters, and which include a random error term. The key geometric tool used in the book is the orthogonal projection of vectors onto a lower dimensional subspace. This tool, although it is used by those doing research in the field, has not been widely presented in other textbooks. The author used it to make the various proofs short, easy to understand and very intuitive.

The target readership is undergraduate students with some knowledge of linear algebra and probability and statistics at the post-calculus level. However, many engineers and scientists using multiple regression or analysis of variance will find a valuable source of information and comprehensive reference to the methodologies. The rather long list of missprinting I discovered do not detract from the ideas explored in the book.

The author with about 20 years of practical and teaching experience produced a clearly structured text. The book follows an introduction-theorem-proof-examples format making possible to understand how to use the methods, but also to know exactly their assumptions and limits.

The examples were chosen very carefully to be simple in their arithmetic computation, but pinning points of the theory presented. The number of practical examples and case-studies are presented with all steps of the solution, even a greater number of problems with a final solution in the appendix are given for practising. A reader will be certainly pleased by short historical notes.

The first part of the book is a self-contained text without skips in derivations building fundamentals of the theory of subspaces, random vectors, and their projections. The general properties of mean vector, the covariance matrix of a pair of random vectors, and expected values of quadratic forms are exploited in Chapter 2. The chapter is concluded with

the study of their relationship with multivariate normal, chi-square, F, and t distributions. The linear model, the basic theory of regression analysis and the analysis of variance, including definitions and properties of different correlation coefficients, are introduced in Chapter 3. Chapter 4 is dedicated to model-building techniques and to the analysis of the effects of deviations from the idealisations made.

I would place the beginning of the second part of the book to Chapter 4 because the author was obviously forced by the limited space of the book to select some general problems of linear models and only to show the basic outlines of their solutions. Therefore the text contains fewer proofs, but more references to original publications with brief examples of usage. In Chapter 5, for example, the reader is informed about the principles of nonlinear least squares, robust regression and bootstrapping and about methods for setting confidence intervals on a fixed number of linear combinations of estimated parameters. The theory of two-way and three-way analysis of variance together with an introduction to the design of experiments is given in Chapters 6 and 7. Finally, the methodology of the analysis of frequency data, again with the emphasis on the vector space viewpoint, is discussed in Chapter 8.

Radek Marik,
University of Surrey

Pattern Classification: A Unified View of Statistical and Neural Approaches, by *Juergen Schuermann,* John Wiley & Sons, 1996, ISBN: 0-471-13534-8.

A new textbook in pattern recognition, written by an expert of the field who has spent his life-time building real commercial systems, has recently appeared. The book comprises twelve chapters covering the most important aspects of pattern classification. The presentation is well balanced between theory and practice.

Chapter 1 starts by clarifying the pattern classification task within the general framework of pattern recognition and artificial intelligence. It then proceeds to an overview of statistical and neural network approaches. To the author's view, the latter is essentially an instance of the former. Basic concepts, such as class, feature, pattern, classifier and learning, are formally introduced. Chapter 2 treats pattern classification from the point of view of statistical decision theory.

The Bayesian framework is adopted, allowing a formal and rigorous introduction of concepts such as risk minimisation and Bayesian classifier. The general structure of a classifier naturally flows out from theoretical considerations. Rejection is completely incorporated into the framework.

Chapter 3 tackles the problem of obtaining the various statistical distribution laws that were assumed known in the decision theory. The author emphasises two fundamentally different approaches to obtain approximations to these statistical laws from training patterns (samples).

The first approximates the posterior probabilities for which the general result of convergence in the mean-square sense is derived, whereas the second approximates the class-specific distributions. To my opinion, the emphasis is important for beginners to the field of pattern recognition since the distinction is often overlooked by the neural network literature. Chapter 4 adopts the second approach and addresses classifier design based on first and second order statistical moments.

They are, in case of Gaussian distributions, sufficient statistics and therefore yield the optimum Bayesian classifier in the limit of infinite number of training samples. In cases of non-Gaussian distributions, first and second order moments still provide an approximation to the Bayesian classifier. Taking advantages of the simplicity of these moments, the author introduces many other advanced concepts that will be further elaborated in subsequent chapters. These concepts include, among others, interpretation of classifier outputs in terms of confidence, set of alternatives, and recursive parameter estimation. Chapter 5 explores in more details the first approach presented in Chapter 3, ie, directly approximating the posterior probabilities. The general scheme of functional approximation is introduced. This opens a vast spectrum of techniques for classifier design. In particular, polynomial regression, multi-layer perceptron regression and radial basis function approximation are briefly discussed; they constitute the basis of the following three chapters.

Chapter 6 presents polynomial regression. The theory is based on linear algebra and numerical analysis, with additional aspects specific to the classification problem thoroughly discussed. The chapter also offers many simple and useful techniques for improving the performance of a pattern classification system, eg confidence mapping (Bayesian calibration) and classifier iteration which is one form of classifier combination. Chapter 7 presents multi-layer perceptron regression, the most commonly used neural network architecture for pattern classification. The presentation is integrated in the unified framework laid out in Chapters 3 and 5. Standard back-propagation learning is discussed in detail as well as various modifications, such as incomplete networks and weight sharing. Chapter 8 considers radial basis functions, a new name for the well-known concept of Parzen estimation introduced in the early 60s. Radial basis functions distinguish themselves from polynomial and multi-layer perceptron regression by their localisation in the measurement space and their capability of approximating either the posterior probabilities or the class-specific distributions.

Chapter 9 addresses feature selection. The fuzzy border between measurement and feature is pointed out. Practical techniques for selecting individual features as well as collectively evaluating them are presented. Finally, the most general technique of feature selection (reduction) based on principal axes transform is discussed. This technique turns out to have far reaching implications on the design process of a pattern classification system in that it splits the design process into two more or less independent sub-processes, namely, representation and discrimination. Chapter 10 discusses in detail the topics of rejection from the decision-theoretic point of view and proposes the use of various operating characteristics as performance measures of classifiers. In fact, the concept of rejection covers three underlying categories, namely, garbage, confusion and set of alternatives, each of which

is clearly situated and explained by examples. The chapter proceeds with using the reject characteristics as a performance measure to compare various classifier design principles. Standard statistical aspects, such as generalisation, sample size and error rate measurements, are also presented.

Chapter 11 addresses a hot research topics of the present time, that of combining classifiers. Various architectures are explored including serial, parallel, hierarchical, and network based. The book is concluded in Chapter 12, where more personal views of the author are expressed through his life-time experience in designing real and successful commercial systems.

The book is written in such a way that it can be read without deeply going into details of mathematics. Most formulas are well commented. Many current research topics are included, eg classifier combination. The contents constitute a compact body of knowledge on pattern classification, all articulated around the Bayesian approach to classification. The book is suitable for a course at the advanced undergraduate and graduate levels. It can also be used as a self-study tool for researchers and practitioners. I really enjoyed reading it.

Thien M Ha,
University of Berne, Switzerland

CONFERENCE REPORT

The First International Conference on Audio- and Video-based Person Authentication (AVBPA'97)

March 12-14, 1997 Crans-Montana, Switzerland

The First International Conference on Audio- and Video-based Biometric Person Authentication (AVBPA'97), held in Crans-Montana in the heart of the marvelous Swiss mountains, brought the speech and face recognition researchers together in an attempt to contribute to robust solutions for the problem of automatic person authentication. The conference was co-chaired by Josef Bigun and Gerard Chollet. The perfect local organisation during both conference time and ski breaks, was taken in charge by Gilbert Maitre.

The conference was held in a good natured manner and most of the presentations were given in an informal atmosphere. This is likely due to the refreshing afternoons (especially for those who did not ski very well and saw the snow from very close) which were scheduled to give the participants the opportunity to benefit from the beautiful mountains surrounding Crans-Montana. After having decompressed all together on the slopes, everybody was ready to participate to the evening conference sessions again.

A good example of this friendly atmosphere was, the non aggressive pact concluded at the very beginning of the conference, when David E Benn promised not to ask any nasty questions later on during the conference, if nobody asked him such a questions after his presentation!

Four invited talks were given during the conference. Rama Chellappa made a comparison between the well-known film "2001, Space Odyssey" and the recent advances in artificial intelligence. Unfortunately, no pop-corn was available during the film projection. John Mason, the second speaker, explained to us the precautions he took at the slopes in order to avoid to turn brown (the question was: are sunglasses prints across your face compatible with the attendance of a serious conference?). After this introduction, he then presented his recent advances in combining speech and lip movement analysis for the purpose of speaker verification. During the third invited paper, Tomaso Poggio proved that human vision works mostly with illusions and is not as good as we think: by simply changing Mr Clinton's hair-style, nobody was able to recognise the President anymore! Finally, a little anecdote concerning the last (but not least) invited speaker, Sadaoki Furui. During the poster session, Professor Furui got some interest in a poster dealing with speaker verification (of course). After having conversed a few moments together, the presenter of the poster asked Professor Furui: "You seem to know much about the topic; are you working in the field of speaker verification???"

The proceedings volume includes 54 contributions. They have been printed by Springer and contribute to the Lecture Notes in Computer Science series (Number 1206). Interested people can order it by contacting Springer directly (email: lncs@springer.de). Around 120 participants registered for AVBPA'97. The social programme was... delicious. During the excursion to the magnificent glacier of Crans-Montana (an altitude of 3000m), we had the chance to eat a typical Swiss raclette. Next day, the conference dinner took place in a sheep-fold. The dinner was as gorgeous as the goat-smell at the entrance was strong! Between the different dishes, we had some traditional dance and music from the Valais for the pleasure of our eyes and ears.

Stephane Pigeon,
Universite Catholique de Louvain

The Center for Imaging Science

The Center is a consortium of universities including Washington, Brown, MIT and Yale Universities, the Universities of Texas at Austin and El Paso, and Lincoln Laboratory. It was made possible through funding from the Army Research Office, USA.

The research of the Center is devoted to the development of mathematical foundations for the representation and understanding of complex scenes. The research is multidisciplinary encompassing physics, mathematics, electrical engineering, computer vision, computer science and cognitive science. The goal of the Center is to develop the fundamental foundations of image understanding for recognizing and describing complex objects contained in natural scenes. The efforts of the Center are organized into three areas of image understanding: (i) representation of complex scenes, (ii) image formation and sensor modeling, and (iii) computational search and optimization. A central theoretical theme involves the use of geometry, focusing on both low dimensional Lie groups for the representation of rigid bodies, as well as high-dimensional groups for deformable, biological shapes. The Center's home page is at http://cis.wustl.edu/

CONFERENCE ANNOUNCEMENTS

ICPR'98
14th International Conference on Pattern Recognition [IAPR]
17–20 August 1998 Brisbane, Australia

ICPR'98 is the international conference sponsored by IAPR. The conference is held every two years and, in 1998, it will be held in Brisbane, Australia. In the tradition of the IAPR organisation, ICPR'98 covers a broad range of topics related to the development of representations and techniques for the encoding, recognition and interpretation of primarily visual information in most sensing modalities, Presentations will be made by experts from many different countries and the conference has a strong multicultural flavour.

ICPR'98 will consist of four parallel tracks (Computer Vision, Pattern Recognition and Analysis, Algorithms and Techniques, and Systems and Applications) where previously unpublished papers will be presented either orally or as posters and include invited papers and special sessions. The official opening and social events are common for all participants. In addition, a set of tutorials/workshops will be given by prominent researchers the day before the conference. There will also be a competition involving the running and evaluation of computer vision and pattern recognition techniques on different data sets with known ground truths. For more details, contact Prof Haralick at haralick@ptah.ee.washington.edu or visit http://george.ee.washington.edu.

Topics include: *Active-Passive Sensing, Feature Extraction, Image Coding, Document Analysis, Curves-Shape Analysis, Statistical Methods, Image Signals, Surveillance, Active Shape, Morphology, Wavelets, Character Recognition, Shape from X, Machine Learning, Image Mappings, Robotics, Active Vision, Connectionist Models, Visualisation, Face/Gesture, Recognition, Biological Vision, Fuzzy Models, Auditory Signals, Handwriting, Robotics/Automation, Hierarchical Models, Software/Architectures, Multi-Media, Invariance and Geometry, Picture Grammars, AI Techniques, Content Queries, Functional Vision, Geometric Reasoning, Distributed Systems, Image Interpretation, Grouping and, Segmentation, Optimisation, Parallel Systems, Digital Libraries, Object Models, Object Recognition, Syntactic Models, Biometry, Motion Analysis, Invariance in Recognition, Statistical Models, GIS -Remote Sensing, Validation and, Verification, Geometric Methods, Medical Applications.*

Papers should not exceed 10 pages (12 pt, double-line spacing) and on the first page the authors should indicate their names along with affiliations and e-mail addresses, a list of key words and the preferred conference track. Send six copies of the paper to the address on p 11.

Deadline for paper submission 15 December 1997
Deadline for camera ready copy 4 May 1998

SPR'98: 2nd International Workshop on Statistical Techniques in Pattern Recognition
11–13 August 1998 Sydney, Australia

Topics: *General methodology, Statistical Classification Techniques, Feature Extraction and Feature Selection, Density Estimation, Approximation by Mixtures, Neural Networks, Clustering Techniques, Contextual Methods, Syntactical and Hybrid Methods, Learning Systems, Random Fields, 2D and 3D Object Recognition, Statistical techniques in image processing, Speech and one-dimensional signal analysis, techniques on document image analysis: handwriting, maps,etc.*

Submit five copies of a paper no longer than 10 pages (double space) to the address on p 11. Title, names and addresses on page 1. On p 2 include a 150 word abstract and keywords. Selected papers will be published in a special edition of the journal Pattern Recognition.

Deadline for paper submission 1 December 1997
Deadline for camera ready paper 1 May 1998

SSIAI
IEEE Southwest Symposiun on Image Analysis and Interpretation
April 6-7, 1998 Tucson, Arizona, USA

Submit 4 copies of an extended abstract of no more than 3 pages using a 12-point font, including figures and references. Include a cover sheet stating the paper title, technical area(s), and corresponding author's information (telephone, fax, postal and email addresses) to the address on p 11.

Deadline for paper submission 1 October 1997
Deadline for camera ready paper 3 February 1998

EUSIPCO-98
IX European Signal Processing Conference
September 8 - 11, 1998 Rhodes, Greece

Topics: *Digital Signal Processing, Statistical Signal and Array Processing, Speech processing, Audio and Electroacoustics, Image and Multidimensional Signal Processing, Knowledge Engineering and Signal Processing, Implementations, and Applications.*

Send 5 copies of a 2-3 page summary of your paper, including figures and references to the address on p 11. Include a cover sheet giving title, authors, corresponding author and contact address, and answers to the following questions: 1) What is the problem and why it is important? 2) What is the original contribution of this work? 3)Does it check and/or extend previously reported work? What work? How does this contribution compare to previously published work? 4) Are the authors of this paper also authors or co-authors of other submissions to this conference? Which? 5) Into which categories does the paper fit?

Deadline for paper submission 31 October 1997
Deadline for camera ready copy 30 April 1998

Vision Interface (VI98)
Computer Vision for Real World Applications: 11th Canadian conference on Computer Vision [IAPR]

18-20 June 1998, Vancouver, Canada

Topics of the conference include, but are not limited to, the following: *Active and real-time vision, Image processing in multimedia computing, Stereo and motion analysis, Document analysis, OCR and Handwriting recognition, Texture analysis, Object recognition, Mathematical morphology, 2D and 3D scene analysis, Biomedical image analysis, Image segmentation, Neural networks, Industrial visual inspection, Content-based image retrieval, Web or network-based image processing and retrieval, Industrial applications, Video retrieval and indexing, Image compression and coding, Document compression and coding, Image database.*

Submit to the address on p 11, four copies of a paper of no more than 15 double-spaced pages, printed font size of at least 11 points, including figures and references. Each paper must have a cover page with the title of the paper, the authors, the affiliation, postal and e-mail addresses, telephone and fax numbers, an abstract with no more than 250 words, and at most 5 keywords in order of preference to classify the paper. In addition, authors are required to submit a cover letter indicating: (1) the postal and e-mail addresses of the corresponding author, (2) telephone and fax numbers of the corresponding author, (3) that the submitted paper has not been and will not be simultaneously submitted to another conference or journal, and (4) that one of the authors will present the paper at the conference if the paper is accepted.

Selected papers will appear in a Special Issue of The International Journal of Pattern Recognition and Artificial Intelligence.

Deadline for paper submission 31 October 1997
Deadline for camera ready copy 31 March 1998

ISMM '98
International Symposium on Mathematical Morphology and its Applications to Image and Signal Processing IV

June 3-5, 1998, Amsterdam, The Netherlands

Submit five copies of a full paper to the address on p 11. Include a title page, containing the names and the addresses of the authors (including e-mail and fax), an abstract of up to 200 words, and 3-5 keywords. A very limited number of grants for participants from countries in Eastern Europe and former Soviet Union will be available. They will cover traveling, registration and hotel expenses. The applicant for a grant must be the author of an accepted paper. Selection will be on the basis of paper quality. Applications must be submitted to the p address on p 11.

Deadline for paper submission 30 September 1997
Deadline for camera ready paper 15 February 1998

SSPR'98
7th International workshop on Structural and Syntactic Pattern Recognition

11–13 August 1998 Sydney, Australia

Topics: *Theoretical issues and formal methods* (Grammar and language based methods, Structural matching: string, trees, graphs, etc, Machine learning and grammatical inference, Mathematical morphology in SSPR, Neural-net based structural recognition, Object-Oriented and Object-Process Methodologies, Graph based methods and representations, graph transformations for pattern recognition, graph transformations for pattern recognition, image structure from graphs). *Applications* (Shape and motion analysis and planning, Pattern-based information retrieval from image document databases and knowledge bases, Pattern-based 2D and 3D object recognition, Pattern-based search on the Internet and other distribution heterogeneous databases, Applications of SSPR to multimedia systems, Structured document image analysis and recognition, Pattern-based speech recognition).

Submit five copies of a paper no longer than 10 pages (double space) to the address on p 11. On p 1 put title, authors' names and addresses and on p 2 a 150-word abstract and keywords. Selected papers will be published in a special edition of the journal Pattern Recognition.

Deadline for paper submission 1 December 1997
Deadline for camera ready copy 1 May 1998

Special issue of the IEEE Expert Magazine
VISION-BASED DRIVING ASSISTANCE IN VEHICLES OF THE FUTURE

Topics include: *Vision-based guidance of unmanned vehicles, Analysis of real-time constraints for vehicle driving, Vehicle navigation in unknown environments, Integration of specialised hardware on vehicles, Description of research prototypes, Legal aspects, Analysis of future trends.*

Two kinds of articles are sought: 1) tutorials and surveys (of approximately 6,000 words) introducing this field and reviewing the state of the art with extensive references to widely available published works. 2) Articles (of 5,500 to 6,000 words, with no more than 12 references) describing prototypes of autonomous vehicles developed worldwide by universities, research centres, corporations, and government institutions.
Submit six hard copies by December 20, 1997, to the address below. For Tutorials or Surveys send an extended abstract first, by October 1, 1997.

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FORTHCOMING CONFERENCES, WORKSHOPS AND EVENTS

1997	Event	Location	Contact
23 Jun - 4 Jul ASI	Face Recognition	Stirling, UK	http://chagall.gmu.edu/faces97/natoasi/
28 Jun - 2 Jul LASR	Bayesian Image Analysis	Leeds, UK	C Gill, Dept of Statistics, University of Leeds, Leeds, LS2 9JT, UK. Tel: +44 113 2335157, Fax: +44 113 2335102, workshop@amsta.leeds.ac.uk, http://www.amsta.leeds.ac.uk/statistics/leeds97/leeds97.html
7–11 July ISIE'97	Industrial Electronics	Guimaraes, Portugal	C A Couto, Dept of Ind Elec, University of Minho, Azurem, 4800 Guimaraes, Portugal. Tel: +351 53510190, Fax: +351 53510189 ccouto@dei.uminho.pt, http://www.dei.uminho.pt/isie97.html
7–11 July SCI'97	Image Processing and related fields	Caracas, Venezuela	M Bennamoun, Signal Processing Research Centre, School of Elec Syst Eng, Queensland University of Technology, GPO Box 2434, Brisbane, QLD 4001, Australia. Tel: +61 7 3864 1204, Fax: +61 7 3864 1516, m.bennamoun@qut.edu.au
18–20 Aug ICDAR '97 [IAPR]	**4th International Conf on Document Analysis**	**Ulm Germany**	**Daimler Benz Research Center Ulm Wilhelm Runge Str 11 89081 Ulm, Germany. icdar97@dbag.ulm.daimlerbenz.com Tel: +49-731-505-2151, Fax: +49-731-505-4105, http://wwwicdar97.dbag.ulm.daimlerbenz.com/ http://www.rtna.daimlerbenz.com/spitz/icdar97.html**
22–23 Aug GREC'97 [IAPR]	**2nd IAPR Workshop on Graphics Recognition (TC-10)**	**Nancy, France**	**Karl Tombre, INRIA Lorraine & CRIN/CNRS 615 rue du jardin botanique, B. P. 101 54602 Villlers-les-Nancy, Cedex, France. Tel: +33 3 8359 2071, Fax: +33 3 8327 8319 tombre@loria.fr, atul@nynexst.com**
24–28 Aug IGS97[IAPR]	**Handwriting and Drawing**	**Genova, Italy**	**ART Srl PO Box 7026, I-16148 Genova, Italy. Fax +39 10 3532154, http://www.psych.kun.nl/igs**
5–9 Sep IWSNHC3DI	Hybrid Coding and 3D Imaging	Rhodes, Greece	M G Strintzis, Dept of Elec & Comp Eng, Aristotle University of Thessaloniki, PO Box 460, 54006 Thessaloniki, Greece. strintzi@eng.auth.gr Tel: +30 31 996351, Fax: +30 31 996342 http://uranus.ee.auth.gr/IWSNHC3DI'97/
7–11 Sep NSIP'97	Nonlinear Signal & Image Processing	Mackinac Island, Michigan	E J Coyle, Elec & Comp Eng, 1285 EE Building, Purdue Univ, West Lafayette, IN 47907 1285, USA. Tel: +1 317 494 3470, Fax: +1 317 494 3358, coyle@purdue.edu, http://www.ecn.purdue.edu/NSIP
10–12 Sep CAIP '97 [IAPR]	**Computer Analysis of Images and Patterns**	**Kiel Germany**	**G Sommer, Institut fuer Informatik, Christian-Albrechts-Universitaet Kiel, Preusserstr. 1-9, D-24105 Kiel, Germany. http://www.informatik.uni-kiel.de/~caip97, Fax: +49 431 560481, caip97@informatik.uni-kiel.de Tel: +49 431 560473**
15–17 Sep DAGM'97	19th DAGM Symposium Mustererkennung (Pattern Recognition)	Braunschweig Germany	F M Wahl, Institute for Robotics, Technical University Braunschweig D-38114 Braunschweig Tel: +49 531 3917451, Fax: +49 531 3915696 dagm97@tu-bs.de , http://www.cs.tu-bs.de/rob/dagm97/
17–19 Sep ICIAP'97 [IAPR]	**International Conference on Image Analysis and Processing**	**Firenze, Italy**	**A Del Bimbo, Dipartimento di Sistemi e Informatica, Universita di Firenze, Via S. Marta 3, I-50139, Firenze, Italy. iciap97@dsi.ing.unifi.it, http://dsi.ing.unifi.it/iciap97/ http://imago.ing.unibs.it/~iapricgb**
22–26 Sep EUROPTO	Image and Signal Processing for Remote Sensing	London, UK	EUROPTO Direct Communications GmbH, Xantener Str 22, D - 10707 Berlin, Germany. Tel: +49 30 881 50 47, fax: +49 30 8868 2946, 100140.3216@Compuserve.com, http://www.dc-europto.com
14–17 Oct SPIE	Machine Inspection, Intelligent Robotics	Pittsburgh, USA	http://www.spie.org/info/is97.html
20–22 Oct CAMP'97	Computer Architecture for Machine Perception	Boston, USA	M Ferretti, DIS Univ di Pavia, Via Ferrata 1, I-27100 Pavia, Italia. Tel: +39 382 505365, Fax: +39 382 505373, http://www.cs.umass.edu/~camp97

FORTHCOMING CONFERENCES, WORKSHOPS AND EVENTS

1997	Event	Location	Contact
3–5 Nov BSDIA'97	Document Image Analysis	Curitiba, Brazil	N A Murshed, Lab of Document Im Anal & NN, Mestrado em Comput, PUC-PR, R Imaculada Conc, 1155, Curitiba, PR 80215-901 Brasil. murshed@rla01.pucpr.br Tel: +55 41 330 1668, Fax: +55 41 330 1620
6–7 Nov IAIF'97	Information Fusion	Adelaide Australia	P Mibus, CSSIP, SPRI Building, Technology Park Adelaide, The Levels, SA 5095 Australia. Tel: +61 8 83025019, Fax: +61 8 83023124, pamela.mibus@cssip.edu.au, heping@cssip.edu.au http://www.cssip.edu.au/Conferences/IAIF/Welcome.html
9–12 Nov CVIV	Intelligent Transportation	Boston, Massachusetts	A Broggi, Dip di Ingegneria dell'Informazione, Universita di Parma, I-43100 Parma, Italy. Fax: +39 521 90 5723, broggi@ce.unipr.it, http://www.ce.unipr.it/itsc97, http://www.ieee.org/itsc/itsc97
1998	**Event**	**Location**	**Contact**
6–9 Jan HICSS	Complex Comp Systems	Hawaii	A Broggi (address as above), http://www.ce.unipr.it/hicss
9–11 Feb ICCIMA'98	Multimedia	Churchill Australia	H Selvaraj, Gippsland School of Comp & Info Technology, Monash University, Churchill, VIC - 3842, Australia Tel: +61 3 9902 6665, Fax: +61 3 9902 6842 iccima98@fcit.monash.edu.au, http://www-gscit.fcit.monash.edu.au/ iccima98
6–7 April SSIAI	Image Analysis	Arizona	N Kehtarnavaz, Dept of Elec Eng, Texas A&M University, College Station, TX 77843-3128 USA. http://www.ece.arizona.edu/conferences/ssiai98
3–5 June ISMM '98	Mathematical Morphology	Amsterdam Netherlands	L M v d Eersten-Schultze, CWI, Kruislaan 413, NL 1098 SJ Amsterdam, The Netherlands. Tel: +31 20 592 4189, Fax: +31 20 592 4199, lieke@cwi.nl, http://www.cwi.nl/projects/morphology/ismm98/
18–20 June VI98	**Computer Vision**	**Vancouver Canada**	**M Cheriet, Dept de Genie de la Production Automatisee, Ecole de Technologie Superieure, 1100, rue Notre-Dame Ouest, Montreal (Quebec) Canada H3C 1K3, cheriet@gpa.etsmtl.ca Tel: +1 514 3968972, Fax: +1 514 3968595, http://www.etsmtl.ca/VI98**
11–13 Aug SPR'98	Statistical PR	Sydney Australia	A Amin (SPR'98), School of Comp Science and Eng, Univ of New South Wales, Sydney 2052, NSW, Australia Fax: +61 2 9 3855995, amin@cse.unsw.edu.au, http://www.cse.unsw.edu.au/ amin/spr98.html
11–13 Aug SSPR'98	Stractural & Syntactic PR	Sydney Australia	A Amin (SSPR'98), School of Comp Science and Eng, Univ of New South Wales, Sydney 2052, NSW, Australia Fax: +61 2 9 3855995, amin@cse.unsw.edu.au, http://www.cse.unsw.edu.au/ amin/sspr98.html
17–20 Aug ICPR'98	**Pattern Recognition**	**Brisbane Australia**	**14 ICPR'98, Conventions Queensland, PO Box 4044, St Lucia South, Queensland 4067, Australia, Tel: +61 7 3870 8831, Fax: +61 7 3371 9514, icpr14@convqld.org.au**
8–11 Sept EUSIPCO-98	Signal Processing	Rhodes Greece	EUSIPCO-98, Dept Informatics, Univ of Athens, Panepistimioupolis, TYPA, Athens 15784, Greece Tel: +30 1 7211119, Fax: +30 1 7219561, eusipco@di.uoa.gr, http://www.di.uoa.gr/ eusipco anonymous ftp.di.uoa.gr in /pub/eusipco

YEAR AT A GLANCE CONFERENCE PLANNER

Contact Addresses Pages: 10–11 Previous Reports are shown in Brackets (volume, number)

• = submission date □= final camera ready copy numbers = actual meeting dates

Conference	Location	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	March	April	May	June	Jul	Aug
SS'97 (v19n1)	Utrecht	2–4													
DSP97 (v19n1)	Santorini	2–4													
ANN'97 (v19n1)	Cambridge, UK	7–9													
AIENG97 (v19n1)	Capri	7–9													
ISIE'97 (v19n2)	Guimaraes	7–11													
SCI'97 (v19n2)	Caracas	7–11													
SPIE (v19n1)	San Diego	27–	1												
ICDAR'97 (v18n3)	Ulm		18–20												
GREC'97 (v19n2)	Nancy		22–23												
IJCAI–97 (v19n1)	Nagoya		23–29												
IGS'97 (v19n2)	Genova		24–28												
TFTS'97 (v19n1)	Coventry	□ 4	27–29												
IWSNHC3DI (v19n2)	Rhodes			5–9											
NSIP'97 (v19n2)	Michigan			7–11											
BMVC'97 (v19n2)	Colchester	□		8–11											
CAIP'97 (v18n3)	Kiel			10–12											
DAGM'97 (v19n2)	Braunschweig			15–17											
ICIAP'97 (v19n2)	Florence			17–19											
EUROPTO (v19n2)	London			22–26											
IWPIA '97 (v19n1)	Hiroshima		□ 1	29–30											
SPIE (v19n2)	Pittsburgh			□ 15	14–17										
CAMP'97 (v19n2)	Boston		□ 1		20–22										
ICIP'97 (v19n1)	Santa Barbara				26–29										
BSDIA'97 (v19n2)	Curitiba	□ 14				3–5									
IAIF'97	Adelaide				□ 1	6–7									
CVIV (v19n2)	Boston		□ 1			9–12									
ICA3PP-97 (v19n1)	Melbourne			□ 1			8–12								
ICCV'98 (v19n1)	Bombay							4–7							
HICSS (v19n2)	Hawaii				□ 1			6–9							
SSIAI	Arizona				• 1				□ 3		6–7				
ICCIMA'98	Churchill	• 7			• 1				9–1						
ISMM '98	Amsterdam			• 30					□ 15				3–5		
VI98	Vancouver				• 31					□ 31			18–20		
EUSIPCO-98	Rhodes				• 31						□ 30				
SPR'98	Sydney						• 1					□ 1			11–13
SSPR'98	Sydney						• 1					□ 1			11–13
14 ICPR	Brisbane						• 15					□ 4			17–20

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